

SAFETY PERFORMANCE DATA

RSPA's Office of Hazardous Materials Safety (OHM) maintains the Hazardous Materials Information System (HMIS). This system is the principal source of safety data related to hazardous materials transportation. It contains comprehensive information on hazardous materials incidents, exemptions and approvals, enforcement actions, and other elements that support the regulatory program.

The HMIS is used by DOT, other Federal agencies, state and local governments, industry, researchers, the media, and the public. HMIS data supports regulatory evaluation and policy making, training programs, the better understanding of hazardous materials transportation incidents, and identification of possible safety problems.

The HMIS migration from its existing database management system into a more robust environment continued in 2000. RSPA expects this migration to improve system performance, maintenance, and accessibility. Alternative methods of archiving incident source documents are ongoing to improve the HMIS storage capability and the ease of retrieving reports. RSPA continues to make more data and reports available to the public on the Office of Hazardous Materials Safety Internet Home Page.

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PLEASE NOTE:

The following analysis is based on HMIS Incident Reports received by DOT through September 14, 2001, and is not based on the most current incident information. Each month DOT continues to receive and process Incident Reports for the current and previous years.

To see the most up-to-date Incident information, please see the "Hazardous Materials Incident Summary Statistics and Data" reached from the SPILLS section of the Office of Hazardous Materials Safety web site:

<http://hazmat.dot.gov/spills.htm>

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2000 Safety Statistics (Data as of September 14, 2001)

In 2000, 17,431 hazardous materials incidents were reported. The total number of incidents decreased by 198 this year. This is an decrease of 1.1 percent. Highway, rail, and air incidents all decreased this year. Highway incidents decreased by 27 to 14,943, remaining at about 86 percent of total incidents. Rail incidents decreased by 18 to 1053. Air incidents remained a small percentage of the total incidents, decreasing just one percent to 8.1 percent of total incidents. When compared to the other modes, air incidents showed the most change, decreasing by 10.1 percent (160 incidents) to 1,420. However, this is the smallest percent change in air incidents from one year to the next over the last eight years. Along with this trend, air incident injuries have continued their downward trend from a high of 57 in 1994 to 5 in 2000. This reflects continued efforts by both RSPA and FAA to improve hazardous materials transportation safety. Although there were few non-bulk water incidents in 2000, these 15 non-bulk water incidents are the highest number reported in the last eight years. Examining the incidents by hazard class, corrosive materials and flammable-combustible liquids were involved in the most incidents, accounting for about 80 percent of all 2000 incidents.

Serious incidents, which RSPA has defined as an incident that involves a fatality or major injury due to a hazardous material, closure of a major transportation artery or facility or evacuation of six or more persons due to the presence of a hazardous material, or a vehicle accident or derailment resulting in the release of a hazardous material, changed very little with a 1.1 percent increase from 1999 to 2000. The 457 serious incidents equal 2.6 percent of all 2000 incidents. Further, in 2000, bulk incidents, while only 18.1 percent of all incidents, accounted for 81.4 percent of all serious incidents.

Eleven incidents in 2000 resulted in fatalities:

- Five were the result of a vehicle crash that caused the loads to ignite (four loads were gasoline and the other was fuel oil).
- One fatality incident was the result of a vehicle crash that released anhydrous ammonia vapor.
- Five were caused by problems that occurred while unloading the material. One of these unloading incidents also caused a fire that burned down a public school (after school hours).

Five rail incidents and one highway incident involved the evacuation of a thousand or more people:

- Five rail cars released 86,000 gallons of a flammable liquid, n.o.s. in Scottsbluff, NE. Local authorities evacuated approximately 3,200 people in the surrounding 25 square blocks for about two days.
- As a result of a multi-car derailment in Eunice, LA, various hazardous materials were released from seven rail cars and 2,500 people were evacuated.
- A release of hydrochloric acid vapor, due to the failure of a rail car's rubber liner, resulted in the evacuation of approximately 2,400 people in Sterling Heights, MI, for about twelve hours.
- An eleven block area of New Iberia, LA, was evacuated for about 24 hours after a train derailment resulted in a release of 600 gallons of xylenes.
- A highway shipment of nitric acid in an unlabeled 55 gallon drum was accidentally unloaded into a container of hypochlorite solution at the Humbolt High School in St. Paul, MN, causing a

chemical reaction resulting in a vapor release. 1,500 people at the school were evacuated while the site was neutralized.

- The crew of a passing train observed smoke coming from a boxcar under seal in Danville, KY. The boxcar containing sodium dithionite was isolated in the yard by evacuating 1,000 people in the surrounding community for about three hours. The car was then moved to a more isolated area for emergency handling and five residences in that area were evacuated for four days.

There were five train derailments in 2000 that resulted in damages greater than \$1 million. These five derailments accounted for 77.4 percent of all damages due to rail and 32.2 percent of all reported damages. The incidents described above maintain the urgency of DOT's continuous work to improve safety in transporting hazardous materials.

Description of Charts and Graphs (Data as of September 14, 2001)

Exhibits 1.1 and 1.2 summarize hazardous materials transportation incidents over the past eight years. The number of incidents increased significantly in 1994 and dropped through 1995 and 1996. Since then, the number of incidents has gradually increased to over 17,000 in both 1999 and 2000. Highway, clearly the most prevalent mode for incidents, accounted for the majority of incidents (86 percent) in the period from 1993 to 2000 and for all fatalities except in 1996, when an air incident and two rail incidents resulted in fatalities, and in 2000, when one rail incident resulted in a fatality. Serious incidents have remained relatively steady throughout the 1990s, with the average number of serious incidents per year being just under 450.

Exhibit 1.3 summarizes vehicular accident and derailment incidents over the past eight years. The average number of incidents per year has been just over 300. All fatalities from these incidents were highway-related, except for two rail fatalities that occurred in 1996. All injuries occurred in the highway and rail modes of transport.

Exhibit 1.4 summarizes hazardous waste incidents over the past eight years. The total number of hazardous waste incidents in 2000 is 48.7 percent lower than the 1995 peak value. The only hazardous waste incident that resulted in a fatality occurred in 1996. Most injuries involved highway and rail modes of transport. The only injuries involving the air mode of transportation occurred in 1998.

Exhibits 2.1 and 2.2 display hazardous materials transportation incidents and fatalities over the past eight years and correspond to data from Exhibit 1.1.

Exhibits 2.3 - 2.6 display the number of incidents by mode over the past eight years. Exhibit 2.5 shows the noticeable increase in reporting of air incidents in 1998 and 1999 and a slight drop in 2000. The number of incidents that are bulk and non-bulk is also shown for highway and rail. The number of bulk incidents has remained fairly steady since 1990, except for a noticeable reduction in bulk rail incidents in 1998.

Exhibit 3.1 displays the hazardous materials incidents reported since 1986 and regulatory changes affecting reporting requirements. The graph is segmented into highway and all other incidents, and shows the impact highway incidents have on the trend of incidents. The increases in incident reporting in 1994 and in 1999 and 2000 are also particularly evident.

Exhibit 3.2 displays the serious hazardous materials incidents since 1990. Note that serious incidents are measured on a different scale than all incidents. Serious incidents have remained relatively steady throughout the 1990s.

Exhibit 3.3 illustrates the number of all incidents since 1990 that involved commodities shipped in bulk packagings. The number of bulk incidents has remained fairly constant during this period; most of the variability in the number of incident reports is due to changes in the number of non-bulk incidents.

Exhibits 4.1.1 and 4.1.3 show reported incidents and damages by hazard class. The first four columns of Exhibit 4.1.1 present and rank incidents by hazard class, and the last four columns present the number of incidents involving dollar damages, damages by dollar amount, percent, and rank. The majority of incidents and damages involved corrosive materials and flammable-combustible liquids. Exhibit 4.1.3 graphically depicts the distribution of incidents among the top five hazard classes.

Exhibit 4.2.1 displays injuries by hazard class. Also included is a breakdown between major and minor injuries. In 2000, corrosive materials, spontaneously combustible materials, flammable-combustible liquids, and poisonous materials accounted for more than 72 percent of injuries.

Exhibit 4.3 lists the hazardous materials involved in incidents resulting in fatalities. One air incident in 1996 involving oxidizers resulted in 110 fatalities. Of the remaining materials, gasoline accounted for the most fatalities each year.

Exhibit 4.4.1 ranks the 50 top hazardous materials involved in incidents. These 50 materials, out of approximately 3,000 hazardous materials identified in the Hazardous Materials Table, 49 CFR §172.101, were involved in 74.9 percent of all incidents in 2000. The Exhibit lists the commodity, corresponding hazard class, number of incidents reported for that commodity, and corresponding percentage.

Exhibit 4.5.1 ranks the hazardous materials involved in serious incidents. These materials were involved in less than three percent of all incidents in 2000. Gasoline accounts for more serious incidents than any other hazardous material. The Exhibit lists the commodity, corresponding hazard class, number of incidents reported for that commodity, and corresponding percentage.

Exhibit 5 shows the distribution of incident damages in the five categories that appear on the report form. Carrier damage and decontamination/cleanup costs made up 83.3 percent of the costs associated with incidents involving damages in 2000.

Exhibit 6.1 shows the breakdown of incident causes by mode of transportation. Human error was the main cause of incidents in 2000. Combined with package failure, these two causes are responsible for over 97 percent of all incidents. Note that for accidents and derailments the cause of the crash is not determined.

Exhibit 7.1 displays information on incidents involving an evacuation. The incidents are broken down by mode, cause, and consequence. Human error was the main cause of evacuation incidents in 2000. While highway had the highest number of incidents with evacuations, rail incidents caused the greatest number of people to be evacuated.

Exhibit 8.1.1 shows the consequences of hazardous materials incidents by transportation phase. As can be expected, most incidents resulting in high damages were due to en route accidents. En route accidents also resulted in the highest number of fatalities. Unloading incidents result in the second largest number of fatalities, the most minor injuries, and by far the largest number of incidents.

Exhibit 8.2.1 displays the consequences of bulk and non-bulk hazardous materials incidents. Although an approximately equal number of minor injury incidents result from bulk and non-bulk incidents, bulk incidents lead to significantly more incidents with major injuries and damages greater than \$50,000, and accounted for all the incidents with fatalities. Non-bulk incidents accounted for the majority of evacuation incidents.

Exhibit 8.3.1 illustrates the consequences of hazardous materials incidents by time of day. Most injuries occur between 9 a.m. and noon. Fatalities are distributed from 9 a.m. to midnight.

Exhibit 9.1 shows the number of serious bulk and non-bulk hazardous materials incidents by time of day. Most serious incidents occurred between 6 a.m. and 3 p.m.

Exhibit 10.1 displays the breakdown of hazardous materials incidents, fatalities, injuries, and damages by state. States with large population centers and industrial cities had the most hazardous materials incidents.

Exhibits 11.1.1 - 11.7.1 display 2000 incident data by county. The areas with the greatest concentration of hazardous materials incidents either were industrial centers or included numerous terminal facilities. Exhibit 11.1.1 displays the location of all incidents reported to RSPA. Exhibit 11.2.1 shows the origin of shipments that resulted in an incident. Exhibit 11.3.1 shows the location of highway incidents and Exhibit 11.4.1 displays the location of rail incidents. Exhibit 11.5.1 shows the location of loading and unloading incidents and Exhibit 11.6.1 shows the location of incidents that occurred en route. Exhibit 11.7.1 shows the location of serious incidents. Note that the exhibits for rail, en route, and serious incidents use a different classification scheme from the other exhibits.

Exhibit 1.1

Incident Statistics by Mode and Reporting Year

Mode	1993	1994	1995	1996	1997	1998	1999	2000	Total
Incidents by Mode									
Air	622	929	813	918	1,029	1,380	1,580	1,420	8,691
Highway	11,080	13,995	12,764	11,916	11,864	12,984	14,970	14,943	104,516
Railway	1,120	1,157	1,153	1,112	1,103	989	1,071	1,053	8,758
Water	8	6	12	6	5	11	8	15	71
Other	0	0	0	0	0	0	0	0	0
TOTALS	12,830	16,087	14,742	13,952	14,001	15,364	17,629	17,431	122,036

Deaths by Mode									
Air	0	0	0	110	0	0	0	0	110
Highway	15	11	7	8	12	13	7	12	85
Railway	0	0	0	2	0	0	0	1	3
Water	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0
TOTALS	15	11	7	120	12	13	7	13	198

Injuries by Mode									
Air	50	57	33	33	24	20	12	5	234
Highway	511	425	296	216	156	153	217	156	2,130
Railway	66	95	71	926	45	22	35	82	1,342
Water	0	0	0	0	0	2	0	0	2
Other	0	0	0	0	0	0	0	0	0
TOTALS	627	577	400	1,175	225	197	264	243	3,708

Damages by Mode (in Dollars)									
Air	88,480	177,695	100,582	87,188	336,178	266,628	285,779	271,629	1,614,159
Highway	19,849,049	25,242,713	22,144,029	29,256,831	24,719,802	28,613,957	31,156,072	36,826,650	217,809,103
Railway	2,650,931	18,673,002	8,485,159	17,385,078	8,355,659	16,363,506	30,372,147	26,517,313	128,802,795
Water	213,091	92,003	173,511	120,146	38,145	1,014,931	60,500	124,645	1,836,972
Other	0	0	0	0	0	0	0	0	0
TOTALS	22,801,551	44,185,413	30,903,281	46,849,243	33,449,784	46,259,022	61,874,498	63,740,237	350,063,029

Source: Hazardous Materials Information System, U.S. Department of Transportation. Data as of 09/14/2001.

Exhibit 1.2

Incident Statistics by Mode and Reporting Year

Serious Incidents

Mode	1993	1994	1995	1996	1997	1998	1999	2000	Total
Incidents by Mode									
Air	9	15	11	13	12	22	15	12	109
Highway	283	335	329	376	346	340	368	347	2,724
Railway	66	76	68	77	66	69	69	96	587
Water	0	1	1	0	0	0	0	2	4
Other	0	0	0	0	0	0	0	0	0
TOTALS	358	427	409	466	424	431	452	457	3,424

Deaths by Mode									
Air	0	0	0	110	0	0	0	0	110
Highway	15	11	7	8	12	13	7	12	85
Railway	0	0	0	2	0	0	0	1	3
Water	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0
TOTALS	15	11	7	120	12	13	7	13	198

Injuries by Mode									
Air	7	33	22	21	4	4	4	0	95
Highway	242	188	88	85	68	54	109	38	872
Railway	11	45	20	892	6	9	3	57	1,043
Water	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0
TOTALS	260	266	130	998	78	67	116	95	2,010

Damages by Mode (in Dollars)									
Air	23,175	69,871	6,041	11,410	6,209	26,168	6,262	49,134	198,270
Highway	13,169,100	14,485,766	16,744,937	23,826,872	18,777,797	22,419,418	23,277,253	28,979,161	161,680,304
Railway	1,935,467	12,385,233	7,492,260	16,619,721	7,399,115	15,506,579	28,542,676	25,498,079	115,379,130
Water	0	0	71,141	0	0	0	0	75,000	146,141
Other	0	0	0	0	0	0	0	0	0
TOTALS	15,127,742	26,940,870	24,314,379	40,458,003	26,183,121	37,952,165	51,826,191	54,601,374	277,403,845

* RSPA defines serious incidents as incidents that involve: a fatality or major injury due to a hazardous material; closure of a major transportation artery or facility or evacuation of six or more persons due to the presence of a hazardous material; or a vehicle accident or derailment resulting in the release of a hazardous material.

Source: Hazardous Materials Information System, U.S. Department of Transportation. Data as of 09/14/2001.

Exhibit 1.3

Incident Statistics by Mode and Reporting Year

Accident / Derailment Incidents

Mode	1993	1994	1995	1996	1997	1998	1999	2000	Total
Incidents by Mode									
Air	0	0	0	0	1	1	0	1	3
Highway	215	243	245	290	258	265	291	278	2,085
Railway	49	52	50	43	53	51	62	62	422
Water	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0
TOTALS	264	295	295	333	312	317	353	341	2,510

Deaths by Mode									
Air	0	0	0	0	0	0	0	0	0
Highway	14	11	6	5	10	8	5	7	66
Railway	0	0	0	2	0	0	0	0	2
Water	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0
TOTALS	14	11	6	7	10	8	5	7	68

Injuries by Mode									
Air	0	0	0	0	0	0	0	0	0
Highway	61	95	14	22	11	11	15	14	243
Railway	1	16	4	842	5	4	0	1	873
Water	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0
TOTALS	62	111	18	864	16	15	15	15	1,116

Damages by Mode (in Dollars)									
Air	0	0	0	0	0	0	0	42,164	42,164
Highway	11,200,448	13,528,095	16,268,066	22,293,396	17,785,687	21,488,847	20,107,391	28,342,273	151,014,203
Railway	1,916,070	12,013,577	7,260,124	15,460,065	7,338,960	15,441,681	28,333,866	23,978,356	111,742,699
Water	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0
TOTALS	13,116,518	25,541,672	23,528,190	37,753,461	25,124,647	36,930,528	48,441,257	52,362,793	262,799,066

Source: Hazardous Materials Information System, U.S. Department of Transportation. Data as of 09/14/2001.

Exhibit 1.4

Incident Statistics by Mode and Reporting Year

Hazardous Waste Incidents

Mode	1993	1994	1995	1996	1997	1998	1999	2000	Total
Incidents by Mode									
Air	1	1	0	0	2	3	2	1	10
Highway	549	519	652	424	379	378	420	321	3,642
Railway	23	27	24	34	38	40	33	25	244
Water	1	0	0	0	0	0	0	0	1
Other	0	0	0	0	0	0	0	0	0
TOTALS	574	547	676	458	419	421	455	347	3,897

Deaths by Mode									
Air	0	0	0	0	0	0	0	0	0
Highway	0	0	0	1	0	0	0	0	1
Railway	0	0	0	0	0	0	0	0	0
Water	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0
TOTALS	0	0	0	1	0	0	0	0	1

Injuries by Mode									
Air	0	0	0	0	0	2	0	0	2
Highway	5	4	23	10	9	4	21	11	87
Railway	0	1	1	3	1	1	6	1	14
Water	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0
TOTALS	5	5	24	13	10	7	27	12	103

Damages by Mode (in Dollars)									
Air	1	0	0	0	75	5,175	2,000	0	7,251
Highway	832,944	1,153,436	1,612,542	1,861,803	3,376,202	907,838	1,285,017	1,029,692	12,059,474
Railway	63,789	1,296,204	466,580	43,960	35,520	31,445	1,071,757	73,490	3,082,745
Water	17,630	0	0	0	0	0	0	0	17,630
Other	0	0	0	0	0	0	0	0	0
TOTALS	914,364	2,449,640	2,079,122	1,905,763	3,411,797	944,458	2,358,774	1,103,182	15,167,100

Source: Hazardous Materials Information System, U.S. Department of Transportation. Data as of 09/14/2001.

Exhibit 2.1

Hazardous Materials Incidents, 1993 - 2000

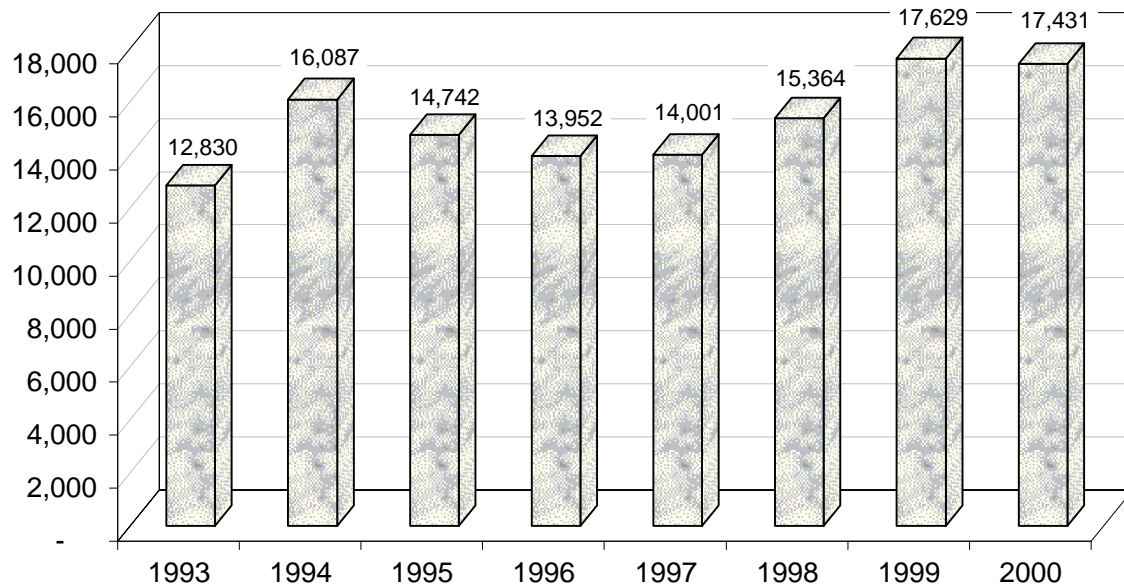
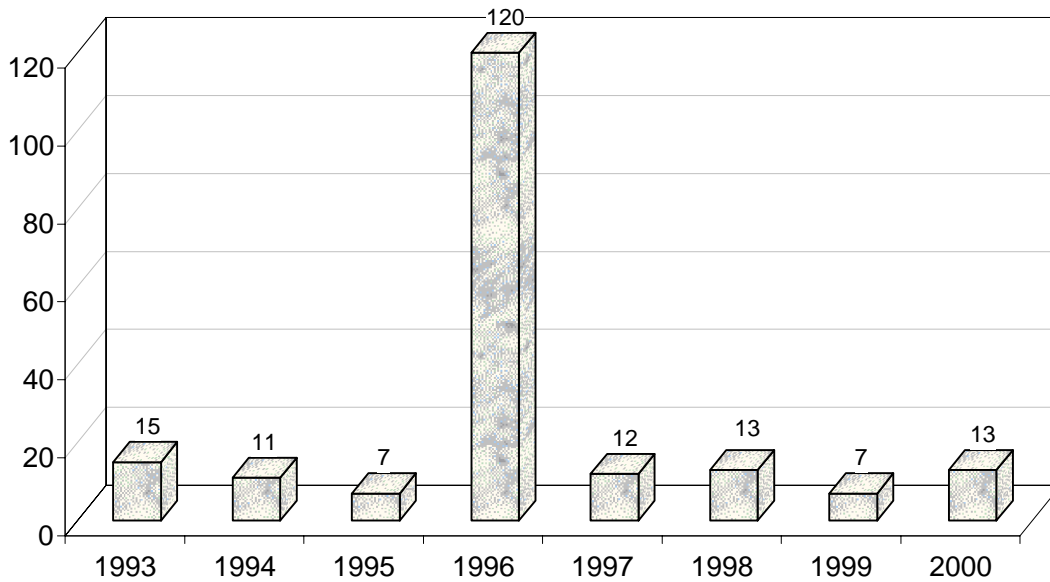


Exhibit 2.2

Fatalities due to Hazardous Materials, 1993 - 2000



Source: Hazardous Materials Information System, U.S. Department of Transportation. Data as of 09/14/2001.

Exhibit 2.3
Hazardous Materials Incidents, 1993 - 2000
Highway by Bulk and Non-Bulk

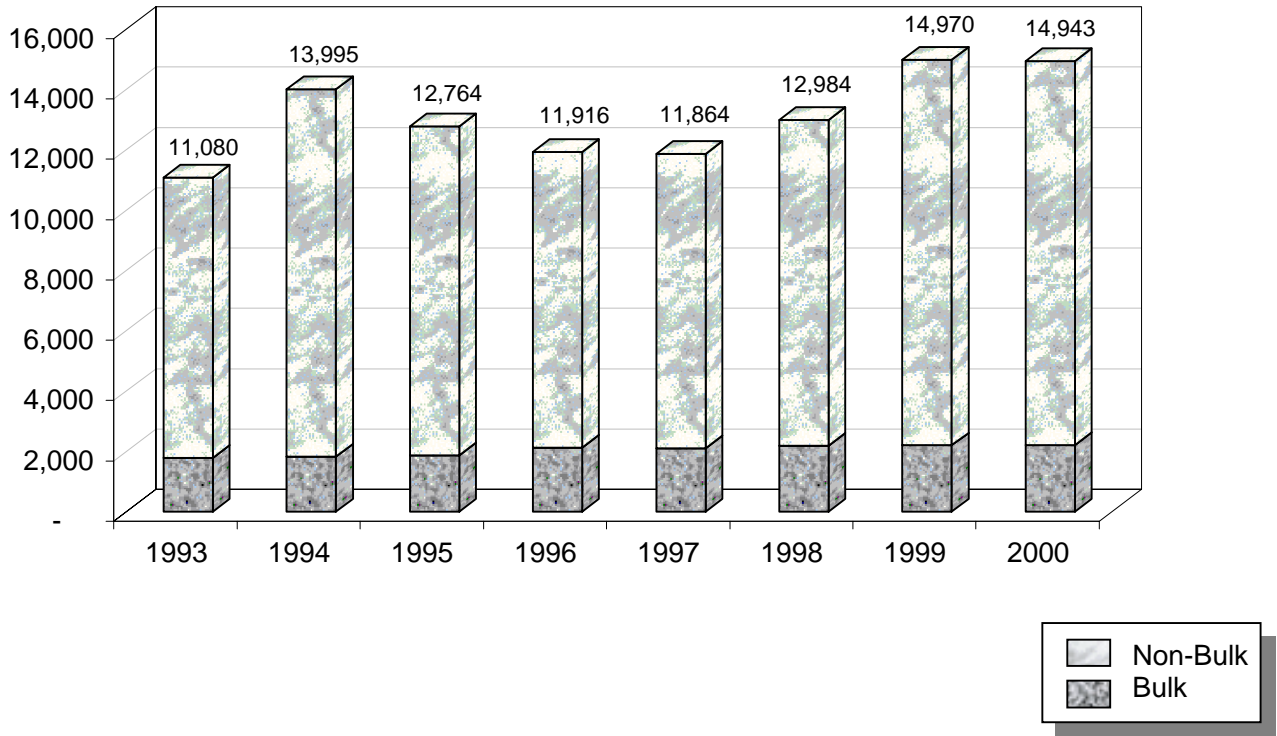
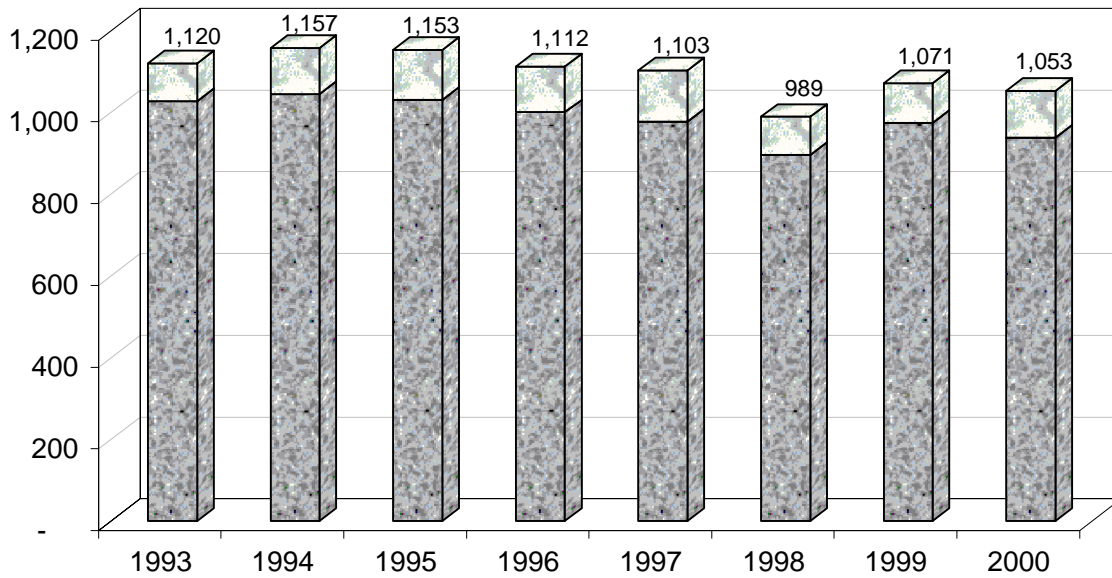


Exhibit 2.4
Hazardous Materials Incidents, 1993 - 2000
Rail by Bulk and Non-Bulk



Source: Hazardous Materials Information System, U.S. Department of Transportation. Data as of 09/14/2001.

Exhibit 2.5
Hazardous Materials Incidents, 1993 - 2000
Air

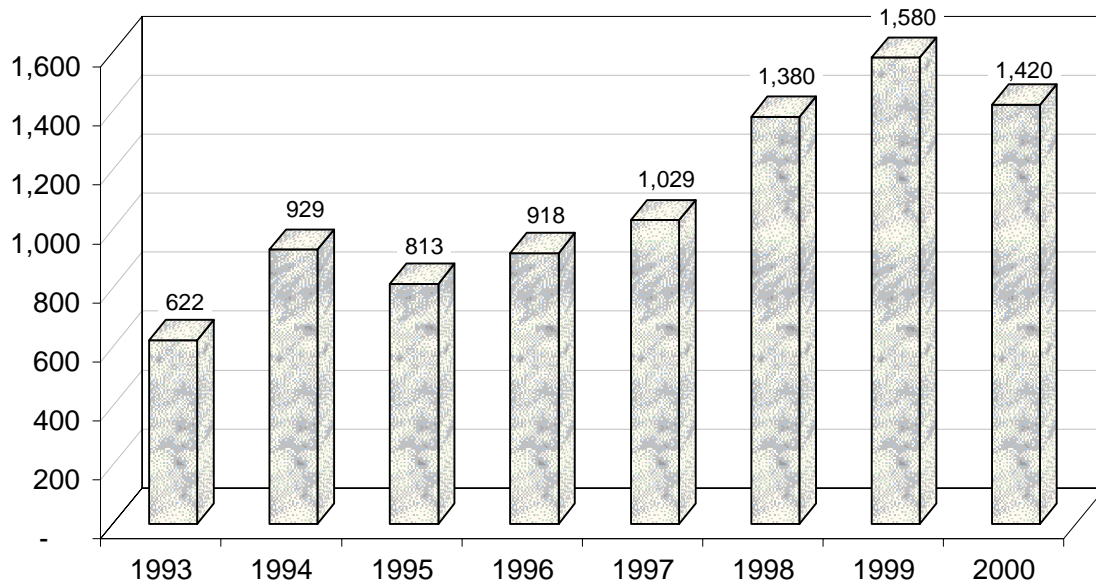
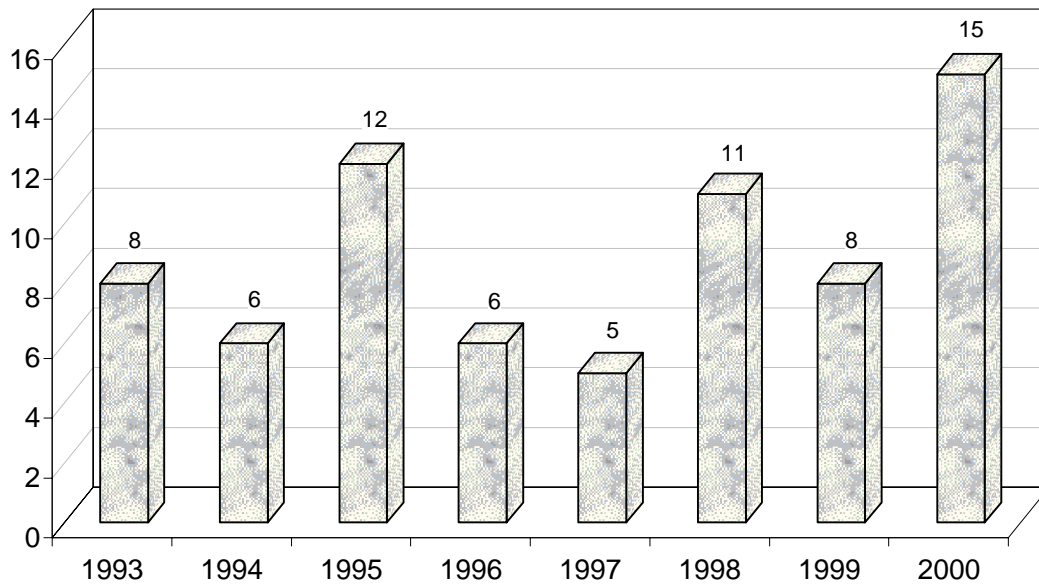


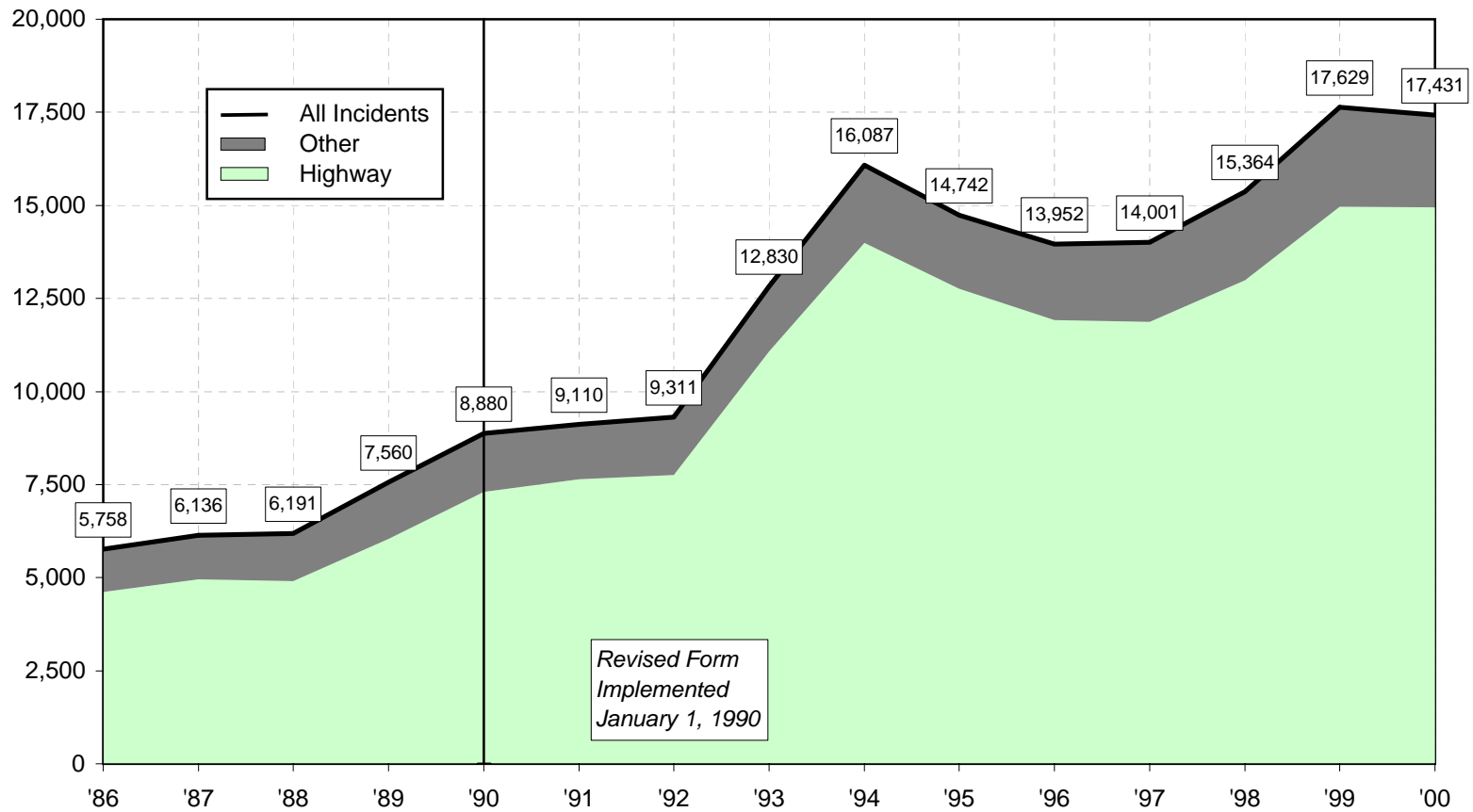
Exhibit 2.6
Hazardous Materials Incidents, 1993 - 2000
Water



Source: Hazardous Materials Information System, U.S. Department of Transportation. Data as of 09/14/2001.

Exhibit 3.1

Hazardous Materials Incidents, 1986-2000

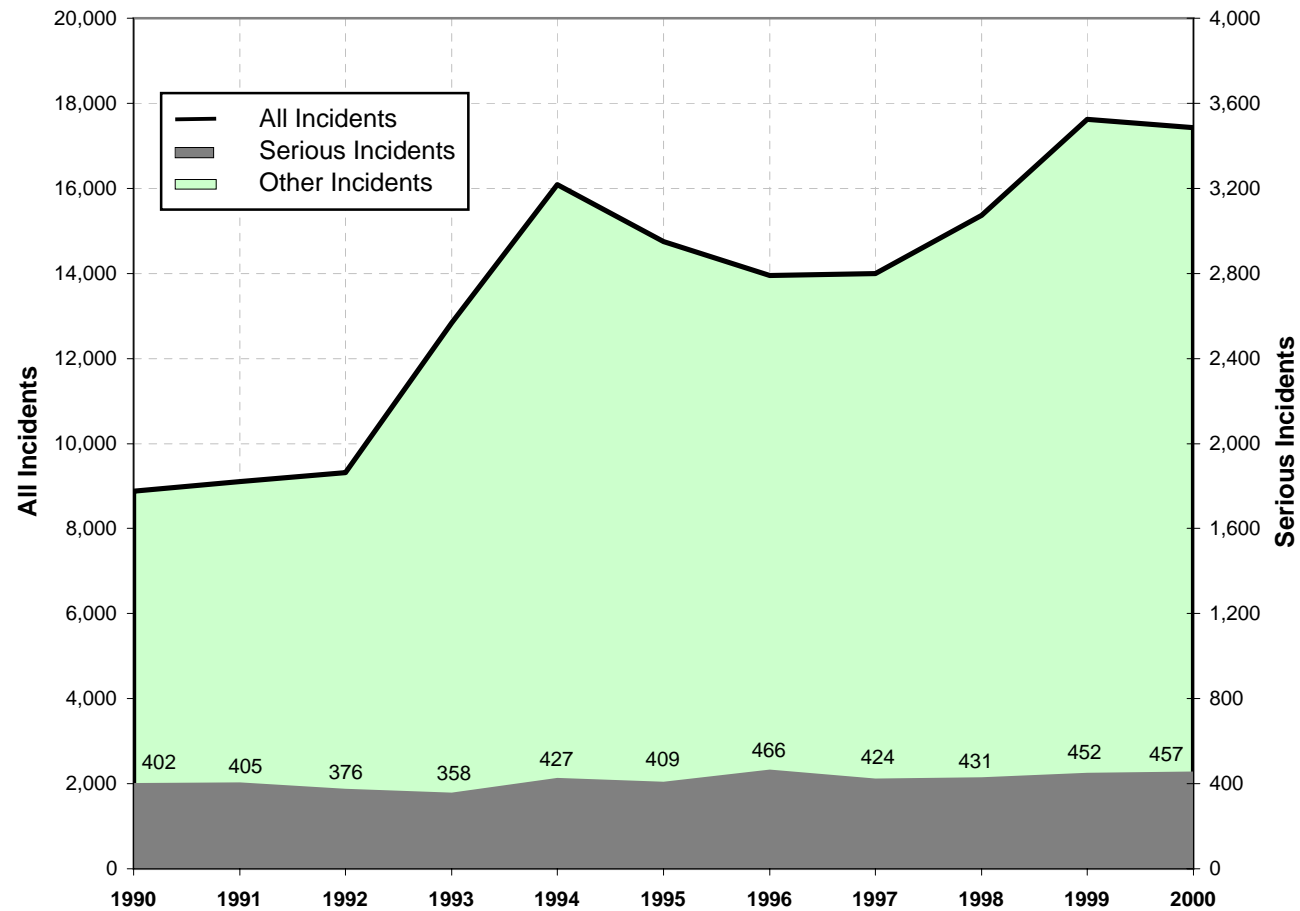


Source: Hazardous Materials Information System, U.S. Department of Transportation. Data as of 09/14/2001.

Exhibit 3.2

Hazardous Materials Incidents, 1990-2000

Serious Incidents



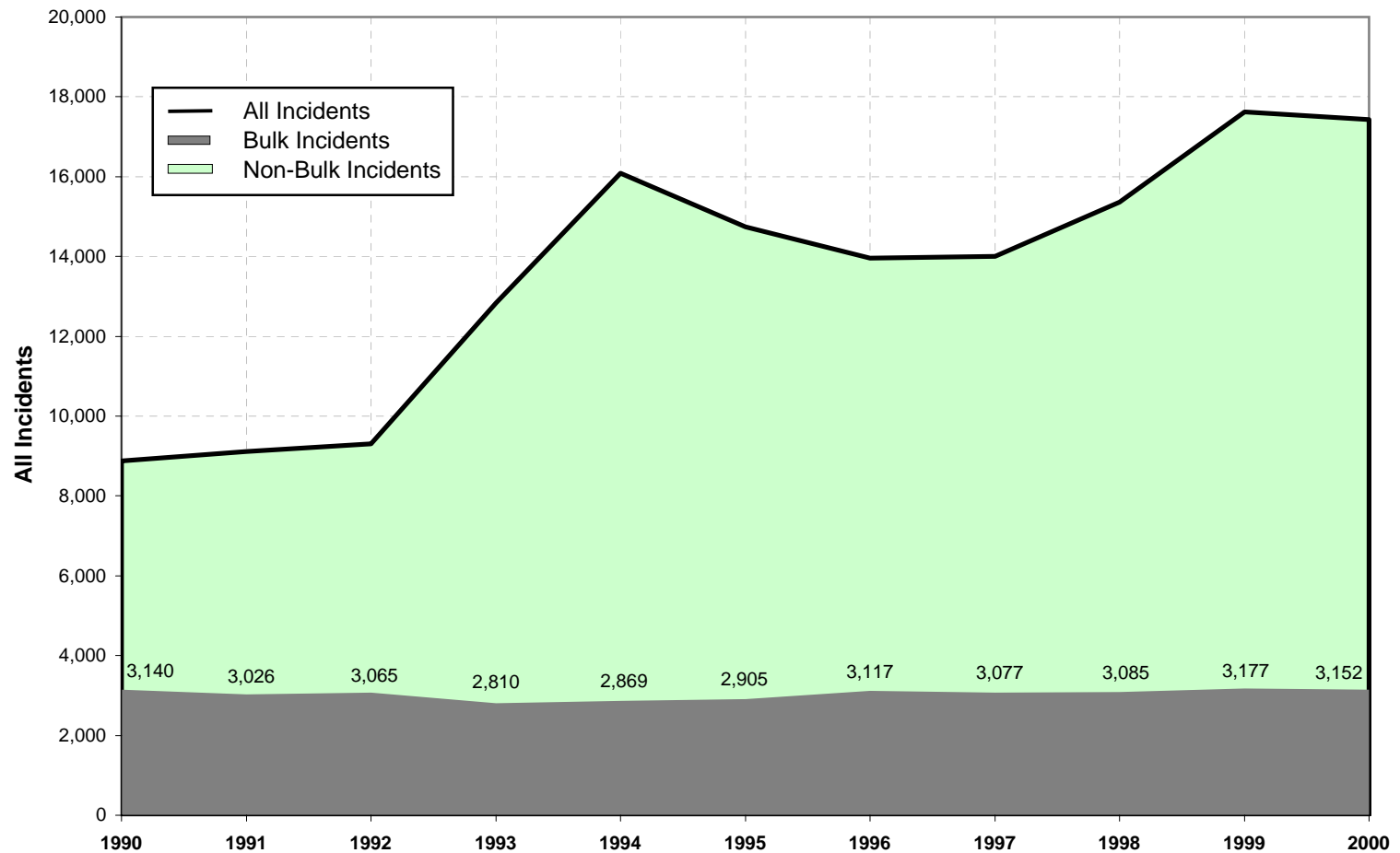
Note: RSPA defines serious incidents as incidents that involve: a fatality or major injury due to a hazardous material; closure of a major transportation artery or facility or evacuation of six or more persons due to the presence of a hazardous material; or a vehicle accident or derailment resulting in the release of a hazardous material.

Source: Hazardous Materials Information System, U.S. Department of Transportation. Data as of 09/14/2001.

Exhibit 3.3

Hazardous Materials Incidents, 1990-2000

Bulk and Non-Bulk Incidents



Note: Bulk packages are defined as those with a maximum capacity greater than 450 L (119 gallons).

Source: Hazardous Materials Information System, U.S. Department of Transportation. Data as of 09/14/2001.

Exhibit 4.1.1

Incidents and Damages by Hazard Class - 2000

Hazard Class *	Number of Reported Incidents	Percent of Reported Incidents	Rank by Incidents	Number of Incidents Involving Damages	Amount of Damages (\$)	Percent of Total Damages	Rank by \$ Damages
Corrosive Material	7,057	40.4	1	5,617	10,185,104	16.0	2
Flammable - Combustible Liquid	6,841	39.2	2	5,085	29,797,187	46.7	1
Poisonous Materials	1,005	5.8	3	717	4,712,306	7.4	4
Miscellaneous Hazardous Material	518	3.0	4	326	8,733,265	13.7	3
Nonflammable Compressed Gas	416	2.4	5	274	898,148	1.4	9
Oxidizer	416	2.4	5	313	1,214,240	1.9	8
Combustible Liquid	327	1.9	7	236	1,825,405	2.9	6
Flammable Gas	247	1.4	8	114	2,864,705	4.5	5
Organic Peroxide	203	1.2	9	192	173,991	0.3	12
Infectious Substance (Etiologic)	139	0.8	10	75	4,476	<.1	19
Flammable Solid	115	0.7	11	69	1,644,664	2.6	7
Other Regulated Material, Class D	61	0.3	12	33	2,252	<.1	20
Poisonous Gas	44	0.3	13	24	852,825	1.3	10
Dangerous When Wet Material	19	0.1	14	13	83,407	0.1	13
Spontaneously Combustible	17	0.1	15	12	579,833	0.9	11
Radioactive Material	13	0.1	16	2	83,000	0.1	14
Explosive No Blast Hazard	10	0.1	17	4	42,269	0.1	15
Very Insensitive Explosive	3	<.1	18	1	22,640	<.1	16
Explosive Mass Explosion Hazard	2	<.1	19	1	5,000	<.1	18
Explosive Projection Hazard	1	<.1	20	1	15,435	<.1	17
Explosive Fire Hazard	1	<.1	20	1	85	<.1	21
TOTALS		100.0			\$63,740,237	99.9	

Note: Since some incidents involve multiple hazard classes, double counting occurs in the "Number of Reported Incidents" and "Number of Incidents Involving Damages" columns. Therefore, no totals are shown for these columns.

The "Percent of Reported Incidents" is based on the sum of the "Number of Reported Incidents" column.

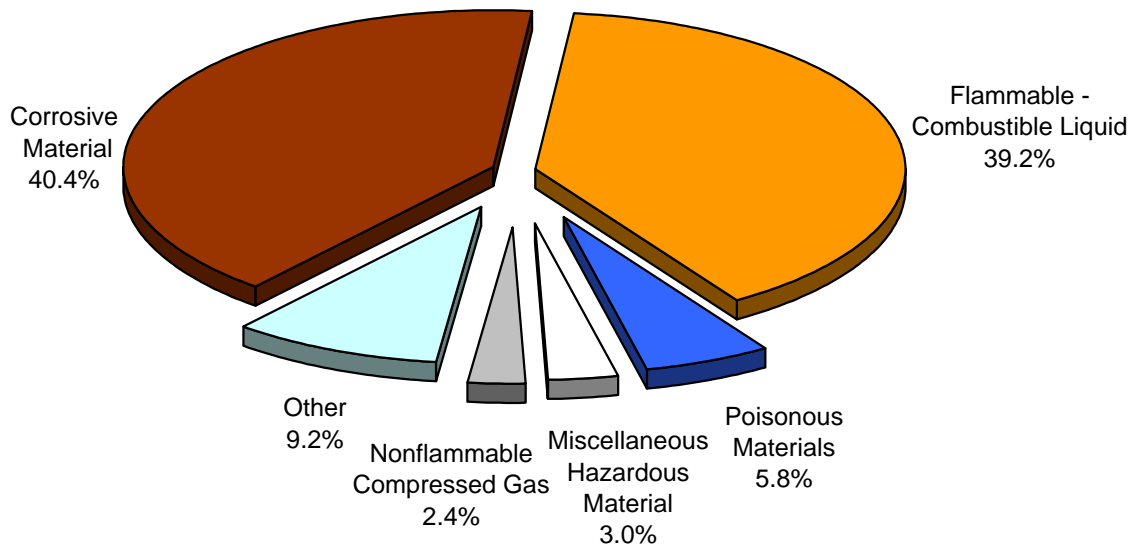
All percent figures are rounded to the nearest tenth.

* No reports were received for other hazard classes.

Source: Hazardous Materials Information System, U.S. Department of Transportation. Data as of 09/14/2001.

Exhibit 4.1.3

Incidents by Hazard Class - 2000



Source: Hazardous Materials Information System, U.S. Department of Transportation. Data as of 09/14/2001.

Exhibit 4.2.1

Hazardous Materials Incidents - 2000

Injuries by Hazard Class

Hazard Class *	Number of Injuries	Percent of Injuries	Major Injuries **	Minor Injuries	Number of Incidents with Injuries		
					Major	Minor	Total ***
Corrosive Material	86	35.4	5	81	5	65	67
Spontaneously Combustible	40	16.5	0	40	0	1	1
Flammable - Combustible Liquid	25	10.3	4	21	4	16	25
Poisonous Materials	25	10.3	3	22	2	12	14
Nonflammable Compressed Gas	17	7.0	1	16	1	9	10
Flammable Gas	15	6.2	3	12	3	7	11
Oxidizer	14	5.8	0	14	0	1	1
Infectious Substance (Etiologic)	10	4.1	0	10	0	10	10
Poisonous Gas	6	2.5	0	6	0	3	3
Miscellaneous Hazardous Material	3	1.2	0	3	0	3	3
Combustible Liquid	1	0.4	0	1	0	1	1
Organic Peroxide	1	0.4	0	1	0	1	1
TOTALS	243	100.0	16	227	15	129	147

Note: All percent figures are rounded to nearest tenth.

* No reports received for other hazard classes.

** Major injuries are those requiring hospitalization or resulting in loss of time at work.

*** Since some incidents involve both major and minor incidents, the "Number of Incidents with Injuries - Total" column may not equal the sum of the two preceding columns.

Source: Hazardous Materials Information System, U.S. Department of Transportation. Data as of 09/14/2001.

Exhibit 4.3

Hazardous Materials Incidents, 1993-2000 Fatalities by Hazard Class / Hazardous Material

Hazard Class Hazardous Material	Number of Fatalities								Total
	1993	1994	1995	1996	1997	1998	1999	2000	
Combustible Liquid	0	0	0	2	0	0	0	0	2
Fuel Oil No. 1,2,4,5,6	...	...	...	1	...	...	...	...	1
Petroleum Distillate	...	...	...	1	...	...	...	...	1
Flammable Gas	0	1	2	0	3	0	0	4	10
Acetylene Dissolved	...	1	...	...	...	...	...	...	1
Petroleum Gases Liquefied	...	...	2	...	3	...	...	4	9
Non Flammable Compressed Gas	0	0	0	0	0	0	0	1	1
Ammonia Anhydrous	...	...	...	...	...	...	...	1	1
Poisonous Gas	0	0	0	2	0	0	0	0	2
Ammonia Anhydrous	...	...	...	1	...	...	...	...	1
Chlorine	...	...	...	1	...	...	...	...	1
Flammable - Combustible Liquid	15	9	5	6	9	13	6	7	70
Alcohols n.o.s.	...	...	...	...	1	...	...	...	1
Asphalt	1	...	...	...	...	...	...	...	1
Butylacrylate	...	...	...	...	...	2	...	...	2
Denatured Alcohol	1	...	...	...	...	...	...	...	1
Diesel Fuel	...	...	...	...	...	...	...	1	1
Flammable Liquids n.o.s.	...	...	...	1	1	...	...	...	2
Fuel Aviation Turbine	1	...	...	...	...	...	...	...	1
Gasoline	12	9	4	4	6	11	5	5	56
Heptanes	...	...	...	...	...	...	1	...	1
Hydrocarbons Liquid n.o.s.	...	...	...	1	...	...	...	...	1
Paint Related Material	...	...	1	...	...	...	...	...	1
Petroleum Distillates n.o.s.	...	...	...	...	...	...	...	1	1
Xylenes	...	...	...	...	1	...	...	...	1
Oxidizer	0	0	0	110	0	0	0	0	110
Oxidizing Solid n.o.s.	...	...	...	110	...	...	...	...	110
Poisonous Materials	0	0	0	0	0	0	0	1	1
Phenol Molten	...	...	...	...	...	...	...	1	1
Corrosive Material	0	0	0	0	0	0	1	0	1
Sodium Hydrosulfide Solution	...	...	...	...	...	...	1	...	1
Miscellaneous Hazardous	0	1	0	0	0	0	0	0	1
Elevated Temp Material Liquid	...	1	...	...	...	...	...	...	1
Total	15	11	7	120	12	13	7	13	198

Source: Hazardous Materials Information System, U.S. Department of Transportation. Data as of 09/14/2001.

Exhibit 4.4.1

Incidents by Top 50 Hazardous Materials - 2000

Rank	Hazardous Material	Hazard Class	Incidents	Percent of Total Incidents	Rank	Hazardous Material	Hazard Class	Incidents	Percent of Total Incidents
1	Flammable Liquids n.o.s.	Flammable - Combustible Liquid	1,195	6.9	27	Flammable Liquids Corrosive n.o.s.	Flammable - Combustible Liquid	137	0.8
2	Corrosive Liquids n.o.s.	Corrosive Material	998	5.7	28	Corrosive Liquid Basic Organic n.o.s.	Corrosive Material	136	0.8
3	Resin Solution	Flammable - Combustible Liquid	751	4.3	29	Regulated Medical Waste	Infectious Substance (Etiologic)	135	0.8
4	Corrosive Liquid Basic Inorganic n.o.s.	Corrosive Material	607	3.5	30	Compounds Cleaning Liquid PHO	Corrosive Material	134	0.8
5	Sodium Hydroxide Solution	Corrosive Material	552	3.2	31	Petroleum Gases Liquefied	Flammable Gas	127	0.7
6	Corrosive Liquid Acidic Inorganic n.o.s.	Corrosive Material	484	2.8	32	Amines Liquid Corrosives n.o.s.	Corrosive Material	125	0.7
7	Corrosive Liquid Acidic Organic n.o.s.	Corrosive Material	479	2.7	33	Organophosphorus Pesticides Solid	Poisonous Materials	124	0.7
8	Potassium Hydroxide Solution	Corrosive Material	437	2.5	34	Extracts Flavoring Liquid	Flammable - Combustible Liquid	120	0.7
9	Adhesives	Flammable - Combustible Liquid	436	2.5	35	Diesel Fuel	Flammable - Combustible Liquid	119	0.7
10	Phosphoric Acid	Corrosive Material	413	2.4	36	Fire Extinguishers	Nonflammable Compressed Gas	116	0.7
11	Caustic Alkali Liquids n.o.s.	Corrosive Material	397	2.3	37	Combustible Liquid n.o.s.	Combustible Liquid	115	0.7
12	Hydrochloric Acid Solution	Corrosive Material	377	2.2	38	Coating Solution	Flammable - Combustible Liquid	113	0.6
13	Paint or Paint Related Material	Flammable - Combustible Liquid	355	2.0	38	Dichloromethane	Poisonous Materials	113	0.6
14	Isopropanol	Flammable - Combustible Liquid	344	2.0	40	Environmentally Hazardous Solid n.o.s.	Miscellaneous Hazardous Material	112	0.6
15	Gasoline	Flammable - Combustible Liquid	317	1.8	41	Paint Related Material	Flammable - Combustible Liquid	107	0.6
16	Printing Ink Flammable	Flammable - Combustible Liquid	309	1.8	42	Methyl Ethyl Ketone	Flammable - Combustible Liquid	96	0.6
17	Sulfuric Acid	Corrosive Material	254	1.5	43	Corrosive Liquids Toxic n.o.s.	Corrosive Material	95	0.5
18	Petroleum Distillates n.o.s.	Flammable - Combustible Liquid	252	1.4	44	Acetone	Flammable - Combustible Liquid	89	0.5
19	Fuel Oil (No. 1,2,4,5,6)	Flammable - Combustible Liquid	228	1.3	44	Ammonia Anhydrous	Nonflammable Compressed Gas	89	0.5
20	Ethanol	Flammable - Combustible Liquid	209	1.2	46	Disinfectant Liquid Corrosive n.o.s.	Corrosive Material	84	0.5
21	Hypochlorite Solution 5-16%	Corrosive Material	187	1.1	47	Hydrogen Peroxide-Peroxyacetic Acid	Oxidizer	82	0.5
22	Environmentally Hazardous Liquid n.o.s.	Miscellaneous Hazardous Material	183	1.0	48	Compounds Cleaning Liquid	Flammable - Combustible Liquid	79	0.5
23	Xylenes	Flammable - Combustible Liquid	160	0.9	48	Organic Peroxide Type E Liquid	Organic Peroxide	79	0.5
24	Fuel Oil No. 1,2,4,5,6	Combustible Liquid	155	0.9	50	Ammonia Solutions 10-35%	Corrosive Material	77	0.4
25	Methanol	Flammable - Combustible Liquid	148	0.8	50	Compounds Cleaning Liquid	Corrosive Material	77	0.4
26	Toxic Liquids Organic n.o.s.	Poisonous Materials	143	0.8					
TOTALS								13,050	74.9

Note: Percentage figures are based on 17,431 incidents reported in 2000 and are rounded to the nearest tenth.
Since some incidents involve multiple hazardous materials, double counting can occur in the "Incidents" column.

Source: Hazardous Materials Information System, U.S. Department of Transportation. Data as of 09/14/2001.

Exhibit 4.5.1

Serious Incidents by Hazardous Material - 2000

Rank	Hazardous Material	Hazard Class	Incidents	Percent of Total Incidents	Rank	Hazardous Material	Hazard Class	Incidents	Percent of Total Incidents
1	Gasoline	Flammable - Combustible Liquid	74	0.4	26	Sodium Hydroxide Solution	Corrosive Material	3	<.1
2	Petroleum Gases Liquefied	Flammable Gas	47	0.3	26	Xylenes	Flammable - Combustible Liquid	3	<.1
3	Diesel Fuel	Flammable - Combustible Liquid	26	0.1	26	Hazardous Waste Solid n.o.s.	Miscellaneous Hazardous Material	3	<.1
4	Flammable Liquids n.o.s.	Flammable - Combustible Liquid	18	0.1	26	Elevated Temperature Material Liquid n.o.	Miscellaneous Hazardous Material	3	<.1
4	Hydrochloric Acid Solution	Corrosive Material	18	0.1	26	Denatured Alcohol	Flammable - Combustible Liquid	3	<.1
6	Fuel Oil (No. 1,2,4,5,6)	Flammable - Combustible Liquid	17	<.1	26	Printing Ink Flammable	Flammable - Combustible Liquid	3	<.1
7	Fuel Aviation Turbine Engine	Flammable - Combustible Liquid	10	<.1	38	Acetic Acid Glacial	Corrosive Material	2	<.1
7	Fuel Oil No. 1,2,4,5,6	Combustible Liquid	10	<.1	38	Acetylene Dissolved	Flammable Gas	2	<.1
7	Sulfuric Acid	Corrosive Material	10	<.1	38	Asphalt	Flammable - Combustible Liquid	2	<.1
7	Environmentally Hazardous Liquid n.o.s.	Miscellaneous Hazardous Material	10	<.1	38	Carbon Dioxide Refrigerated Liquid	Nonflammable Compressed Gas	2	<.1
11	Ammonia Anhydrous	Nonflammable Compressed Gas	9	<.1	38	Chlorine	Poisonous Gas	2	<.1
11	Methanol	Flammable - Combustible Liquid	9	<.1	38	Ethanol	Flammable - Combustible Liquid	2	<.1
13	Ammonium Nitrate <0.2%	Oxidizer	8	<.1	38	Hydrocarbons Liquid n.o.s.	Flammable - Combustible Liquid	2	<.1
14	Corrosive Liquids n.o.s.	Corrosive Material	7	<.1	38	Hydrogen Peroxide >60%	Oxidizer	2	<.1
14	Hypochlorite Solution 5-16%	Corrosive Material	7	<.1	38	Kerosene	Combustible Liquid	2	<.1
16	Adhesives	Flammable - Combustible Liquid	5	<.1	38	Methyl Chloride	Flammable Gas	2	<.1
17	Combustible Liquid n.o.s.	Combustible Liquid	4	<.1	38	Methyl Methacrylate Monomer Inhibited	Flammable - Combustible Liquid	2	<.1
17	Nitric Oxide	Poisonous Gas	4	<.1	38	Petroleum Oil	Combustible Liquid	2	<.1
17	Oxygen Refrigerated Liquid	Nonflammable Compressed Gas	4	<.1	38	Petroleum Distillates n.o.s.	Flammable - Combustible Liquid	2	<.1
17	Paint or Paint Related Material	Flammable - Combustible Liquid	4	<.1	38	Propionic Acid	Corrosive Material	2	<.1
17	Phosphoric Acid	Corrosive Material	4	<.1	38	Resin Solution	Flammable - Combustible Liquid	2	<.1
17	Corrosive Liquid Basic Inorganic n.o.s.	Corrosive Material	4	<.1	38	Sodium Chlorate	Oxidizer	2	<.1
17	Environmentally Hazardous Solid n.o.s.	Miscellaneous Hazardous Material	4	<.1	38	Toluene Diisocyanate	Poisonous Materials	2	<.1
17	Phenol Molten	Poisonous Materials	4	<.1	38	Toluene	Flammable - Combustible Liquid	2	<.1
17	Sulfur Molten	Flammable Solid	4	<.1	38	Vinyl Acetate Inhibited	Flammable - Combustible Liquid	2	<.1
26	Acrylic Acid Inhibited	Corrosive Material	3	<.1	38	Corrosive Liquid Acidic Inorganic n.o.s.	Corrosive Material	2	<.1
26	Caustic Alkali Liquids n.o.s.	Corrosive Material	3	<.1	38	Corrosive Liquid Acidic Organic n.o.s.	Corrosive Material	2	<.1
26	Petroleum Crude Oil	Flammable - Combustible Liquid	3	<.1	38	Elevated Temp Liquid Flammable n.o.s.	Flammable - Combustible Liquid	2	<.1
26	Propane	Flammable Gas	3	<.1	38	Hypochlorite Solutions	Corrosive Material	2	<.1
26	Nitric Acid <70%	Corrosive Material	3	<.1					
26	Nitrogen Refrigerated Liquid	Nonflammable Compressed Gas	3	<.1	61	86 materials tied for this rank	...	1 each	0.5
TOTAL									2.6

Note: Percentage figures are based on 17,431 incidents reported in 2000 and are rounded to the nearest tenth.

RSOA defines serious incidents as incidents that involve: a fatality or major injury due to a hazardous material; closure of a major transportation artery or facility or evacuation of six or more persons due to the presence of a hazardous material; or a vehicle accident or derailment resulting in the release of a hazardous material.

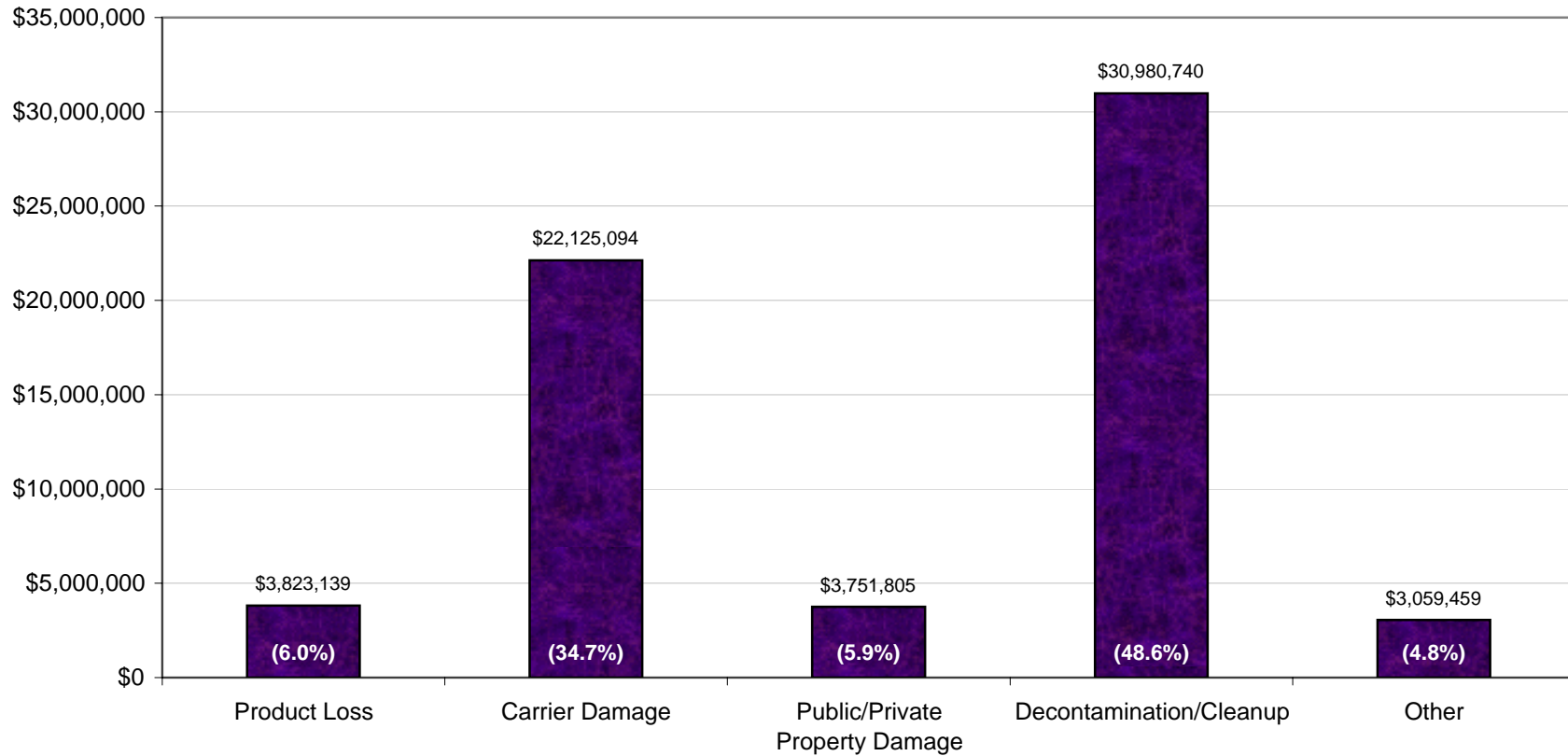
Since some incidents involve multiple hazardous materials, double counting can occur in the "Incidents" column. Therefore, no total is shown for this column.

Source: Hazardous Materials Information System, U.S. Department of Transportation. Data as of 09/14/2001.

Exhibit 5

Characterization of Hazardous Materials Incident Damages, 2000

Damages



Note: The numbers in parentheses show the percent of the total reported damages

Source: Hazardous Materials Information System, U.S. Department of Transportation. Data as of 09/14/2001

Exhibit 6.1

Hazardous Materials Incidents - 2000

Cause by Mode

Cause	Air	Highway	Rail	Water	Total	Percent of all Incidents*
Human Error	1,208	13,103	651	11	14,973	85.9
Package Failure	201	1,526	336	4	2,067	11.9
Vehicular Accident/Derailment	1	277	62	0	340	2.0
Other	10	37	4	0	51	0.3
TOTALS	1,420	14,943	1,053	15	17,431	...
Percent of Incidents by Mode	8.1	85.7	6.0	0.1	...	...

Note: All percent figures are rounded to the nearest tenth.

Source: Hazardous Materials Information System, U.S. Department of Transportation. Data as of 09/14/2001.

Exhibit 7.1

Hazardous Materials Incidents - 2000

Evacuations - Cause and Consequence by Mode

Mode	Incidents With Evacuations	CAUSE				CONSEQUENCE			
		Human Error	Package Failure	Accident/ Derailment	Other	People Evacuated	Deaths	Major Injuries *	Minor Injuries
Air	99	87	12	0	0	720	0	0	0
Highway	112	57	24	30	1	4,835	3	3	15
Railway	50	16	14	19	1	19,129	0	0	44
Water	2	1	1	0	0	55	0	0	0
TOTALS	263	161	51	49	2	24,739	3	3	59

* Major injuries are those requiring hospitalization or resulting in loss of time at work.

Source: Hazardous Materials Information System, U.S. Department of Transportation. Data as of 09/14/2001.

Exhibit 8.1.1

Hazardous Materials Incidents - 2000 Consequences by Transportation Phase

TRANSPORTATION PHASE	DEATHS		MAJOR INJURIES *		MINOR INJURIES		DAMAGES > \$50,000		EVACUATIONS		TOTAL INCIDENTS
	Incidents	People	Incidents	People	Incidents	People	Incidents	\$	Incidents	People	
En Route/Accident	6	7	4	4	6	11	141	49,069,892	48	9,831	330
En Route/Non-Accident	0	0	4	4	29	77	6	2,029,229	76	6,642	2,713
Loading	0	0	1	1	23	24	2	265,300	15	281	3,218
Unloading	5	6	5	5	62	81	10	1,225,514	44	3,874	9,824
Storage/Terminal	0	0	1	2	9	34	4	594,187	78	3,211	844
TOTALS	11	13	15	16	129	227	163	53,184,122	261	23,839	16,929

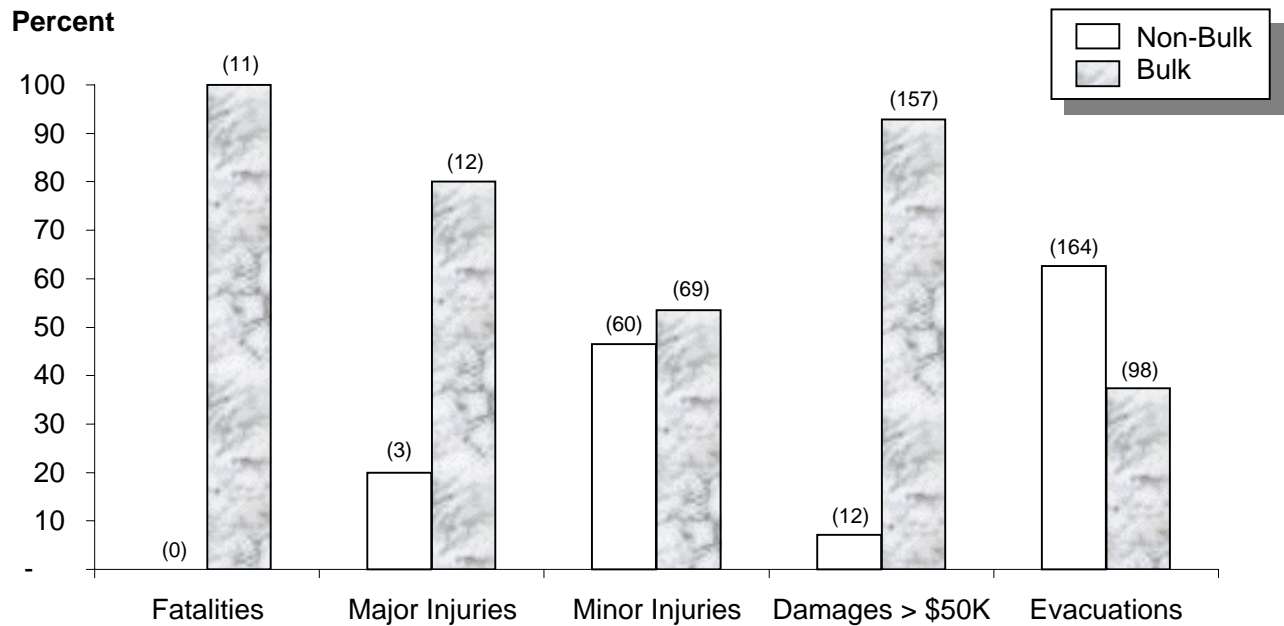
* Major injuries are those requiring hospitalization or resulting in loss of time at work.

Source: Hazardous Materials Information System, U.S. Department of Transportation. Data as of 09/14/2001.

Exhibit 8.2.1

Hazardous Materials Incidents, 2000

Consequences by Bulk and Non-Bulk



Note: Bulk packages are defined as those with a maximum capacity greater than 450 L (119 gallons).
Numbers in parentheses show the number of incidents resulting in each consequence.

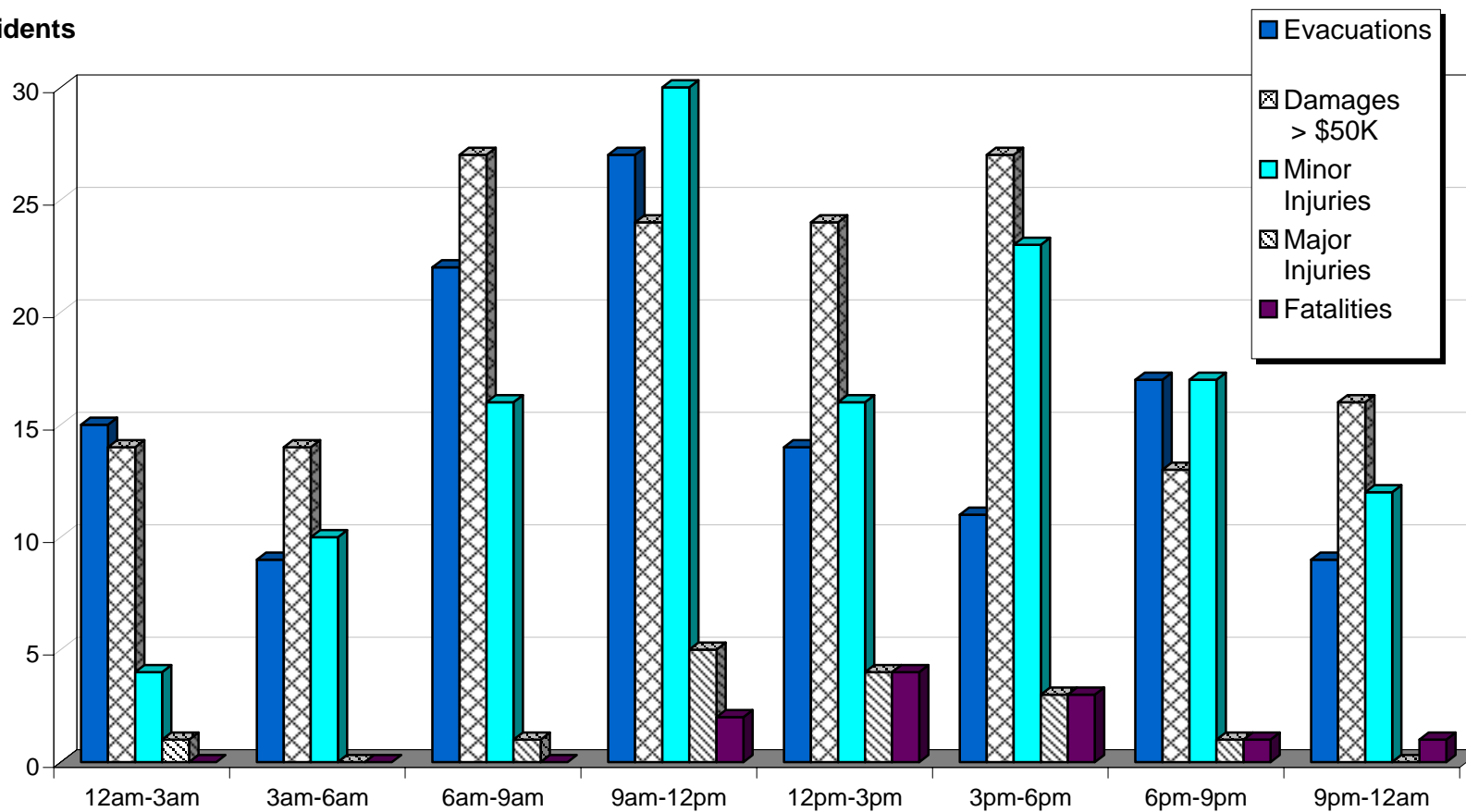
Source: Hazardous Materials Information System, U.S. Department of Transportation. Data as of 09/14/2001.

Exhibit 8.3.1

Hazardous Materials Incidents - 2000

Consequences by Time of Day

Incidents



Source: Hazardous Materials Information System, U.S. Department of Transportation. Data as of 09/14/2001

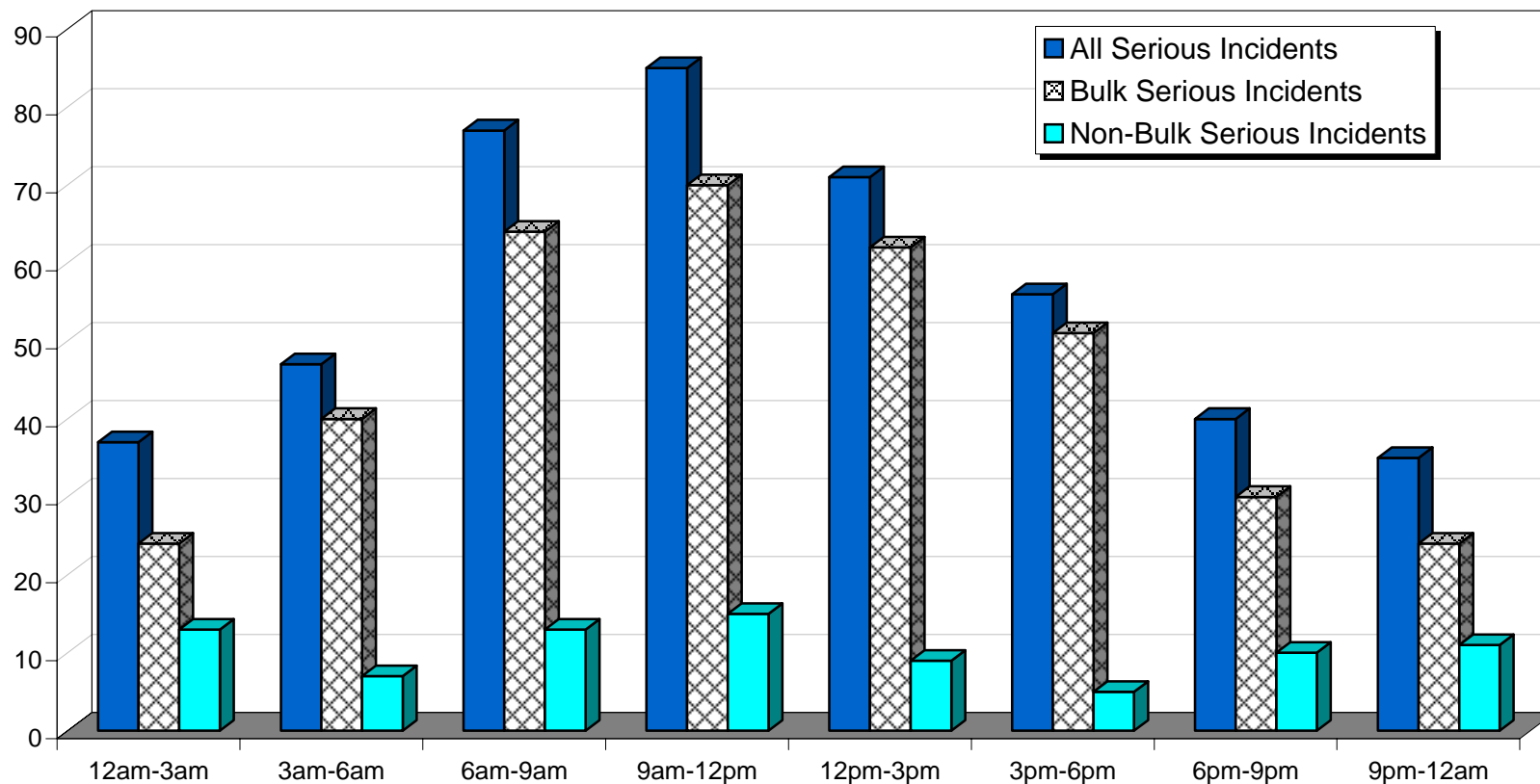
Exhibit 9.1

Hazardous Materials Incidents - 2000

Serious Incidents by Time of Day

Bulk and Non-Bulk

Incidents



Note: RSPA defines serious incidents as incidents that involve: a fatality or major injury due to a hazardous material; closure of a major transportation artery or facility or evacuation of six or more persons due to the presence of a hazardous material; or a vehicle accident or derailment resulting in the release of a hazardous material.

Bulk packages are defined as those with a maximum capacity greater than 450 L (119 gallons)

Source: Hazardous Materials Information System, U.S. Department of Transportation. Data as of 09/14/2001

Exhibit 10.1

Hazardous Materials Incidents - 2000

By State

State	Incidents	Deaths	Injuries		\$ Damages	State	Incidents	Deaths	Injuries		\$ Damages
			Major	Minor					Major	Minor	
Alabama	217	0	0	0	1,015,884	Montana	33	0	0	0	40,236
Alaska	43	0	0	0	384,168	Nebraska	91	0	0	0	3,101,517
Arizona	203	2	2	2	497,047	Nevada	59	1	0	0	348,929
Arkansas	226	0	0	4	1,058,415	New Hampshire	26	0	0	0	14,333
California	1,191	0	0	12	5,132,070	New Jersey	474	0	0	3	277,502
Colorado	259	0	1	3	448,918	New Mexico	95	0	0	1	97,681
Connecticut	316	0	0	1	536,697	New York	620	0	0	4	1,221,197
Delaware	31	0	0	1	36,147	North Carolina	720	0	0	8	1,299,881
Dist. of Columbia	6	0	0	0	2,304	North Dakota	21	0	0	0	37,725
Florida	713	1	0	8	1,138,606	Ohio	1,558	2	2	8	958,340
Georgia	458	0	1	5	2,981,303	Oklahoma	233	1	0	0	581,894
Hawaii	9	0	0	0	755	Oregon	305	0	0	2	5,672,069
Idaho	35	0	0	1	23,400	Pennsylvania	1,110	0	0	11	2,864,002
Illinois	963	0	2	5	853,410	Rhode Island	17	0	0	2	731,162
Indiana	484	0	0	3	1,068,042	South Carolina	160	1	0	15	628,356
Iowa	118	0	0	0	589,392	South Dakota	24	2	0	1	371,671
Kansas	357	0	0	0	106,978	Tennessee	1,014	0	0	5	416,865
Kentucky	430	0	1	46	1,315,893	Texas	1,450	1	5	40	4,049,206
Louisiana	333	0	1	11	16,605,079	Utah	248	0	0	0	1,018,795
Maine	23	0	0	0	162,516	Vermont	19	0	0	0	344,453
Maryland	323	0	0	1	675,148	Virginia	143	0	1	6	372,254
Massachusetts	343	0	0	2	717,295	Washington	178	1	0	2	483,570
Michigan	425	0	0	5	161,488	West Virginia	77	0	0	0	150,640
Minnesota	309	0	0	3	2,035,744	Wisconsin	253	1	0	1	438,345
Mississippi	206	0	0	3	158,682	Wyoming	34	0	0	0	128,943
Missouri	384	0	0	2	334,060	Other *	64	0	0	0	51,230
						TOTAL	17,431	13	16	227	\$63,740,237

* Incidents involving U.S. carriers that occurred in territorial possessions or foreign countries.

Source: Hazardous Materials Information System, U.S. Department of Transportation. Data as of 09/14/2001.